

Part A. PERSONAL INFORMATION

CV date	13/11/2023
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First and Family name	María Jesús Santos Sánchez		
Social Security, Passport, ID number	07864423X	Age	56
Researcher codes	Open Researcher and Contributor ID (ORCID**)	0000-0003-2412-9215	
	SCOPUS Author ID (*)	57145860500	
	WoS Researcher ID (*)	E-2912-2016	

(*) *Optional*

(**) *Mandatory*

A.1. Current position

Name of University/Institution	Universidad de Salamanca		
Department	Applied Physics		
Address and Country	Faculty of Sciences, 37008, Salamanca, Spain		
Phone number	+34677565481	E-mail	smjesus@usal.es
Current position	Senior Lecturer	From	28/06/2022
Key words	Thermodynamics; Optimization; Concentrated Solar Power		

A.2. Education

PhD, Licensed, Graduate	University	Year
Physics	University of Salamanca	2012

A.3. General indicators of quality of scientific production

- ✓ 29 JCR articles (14 last five years, 9 Q1), 2 book chapter
 - ✓ h-index: 10 (Web of Science), 12 (Scopus), 16 (Google Scholar)
 - ✓ Sum of times cited: 324
- Research section recognized by the University of Salamanca through the Advisory Committee of CNEAI number 1 (June 2018): Period: 2011 –2016
 - I am currently the Vice Dean of the Faculty of Sciences of USAL. And the president of the local Salamanca Section of the Royal Spanish Physical Society.

B. CV SUMMARY

Member of the “Grupo de Investigación en optimización Energética, Termodinámica y Física Estadística”. Group that is also “Unidad de Investigación Consolidada de Castilla y León”, UIC 004. Dr. D. Antonio Calvo Hernández, University of Salamanca (USAL), director of both.

Different lines of research: *teaching*, investigation in *liquid drops*, basic thermodynamics, in *steam pressure topics* & hermodynamics of *hybrid thermosolar plants type Brayton*.

In teaching and academic fields, I have taught in the Degree in Physics, Degree in Geology and Degree in History and Science of Music at the USAL and in several engineering degrees (Industrial Engineering, Chemical Engineering, Geological Engineering). As in the Master's Degree in Teaching (MUPES) of the USAL.

Obtaining the rating of EXCELLENT in the Evaluation Report of the Teaching Activity of the Faculty of the USAL in the call 2011/17 & 2016/20.

I also regularly participate in Physics dissemination programs, giving lectures in teaching centers both primary and secondary, participating in "Science in Action" (Fecyt) having been awarded our work on several occasions.



C. RELEVANT MERITS

C.1. Publications (last 5 years)

1. J. García-Ferrero, R.P. Merchán, M.J. Santos, A. Medina, A. Calvo-Hernández, Paolo Canhoto, Andrea Giostri
Modeling a solar pressurized volumetric receiver integrated in a parabolic dish: off-design heat transfers, temperaturas, and efficiencies *Energy Conversion and Management*, 2023, 293, 117436
<https://doi.org/10.1016/j.enconman.2023.117436>
2. J. García-Ferrero, R.P. Merchán, M.J. Santos, A. Medina, A. Calvo-Hernández,
Brayton technology for CSP plants: comparative analysis of central tower plants and parabolic dish farms *Energy Conversion and Management*,
<https://doi.org/10.1016/j.enconman.2022.116312>
3. E. Jiménez-Sánchez, E. Montes-López, M.J. Santos Sánchez
Impact of the COVID-19 confinement on the Physics and Chemistry didactic in high school *Sustainability*, especial number: Rebuilding Education: STEM Education Practices and Research during the Post-COVID-19 Era; 2022 14(11), 6754
<https://doi.org/103390/su14116754> eISSN: 2071-1050 (3.251 Q2)
4. Merchán, R.P., Santos, M.J., Medina, A. & Calvo, A.
High Temperature Central Tower Plants for Concentrated Solar Power: 2021 Overview *Renewable and Sustainable Energy Reviews*, 2021 ISSN: 1364-0321 (14.982 Q1)
5. García-Ferrero, J., Merchán, R.P., Roco, J.M.M., Medina, A. & Santos, M.J.
Towards a Sustainable Future through Renewable Energies at Secondary School: An Educational Proposal *Sustainability*, 2021, 13 (22), 12904 eISSN: 2071-1050 (3.251 Q2)
6. Santos, M. J., Medina, A., Mateos Roco, J. M., & Queiruga-Dios, A.
Compartmental Learning versus Joint Learning in Engineering Education *Mathematics*, 9(6), 662, 2021 ISSN: 2227-7390 (1.747 Q1)
7. Queiruga-Dios, M., Santos, M.J., Queiruga-Dios, A., Mauricio P. & Queiruga-Dios. M.A.
Assessment Methods for Service-Learning Projects in Engineering in Higher Education: A Systematic Review *Frontiers in psychology*, 2021, p. 2817 ISSN: 1664-1078 (2.990 Q2)
8. Merchán, R.P., Santos, M.J., García-Ferrero, J., Medina, A. & Calvo, A.
Thermo-economic analysis of a central tower hybrid Brayton thermo-solar plant: sensitivity to main design parameters *Applied Thermal Engineering*, 2020 ISSN: 1359-4311 (4.725 Q1)
9. García-Ferrero, J., Heras, I., Santos, M.J., Merchán, R.P., Medina, A., González, A. & Calvo, A.
Thermodynamic and Cost Analysis of a Solar Dish Power Plant in Spain Hybridized with a Micro-Gas Turbine *Energies* 2020, 13(19), 5178 ISSN: 1996-1073 (2.702 Q3)
10. Merchán, R. P., Santos, M. J., Medina, A., & Calvo, A.
On-and off-design thermodynamic analysis of a hybrid polar solar thermal tower power plant *International Journal of Energy Research*, 2020 ISSN: 0363-907X (3.741 Q1)



11. Merchán, R. P., Santos, M. J., Heras, I., González-Ayala, J., Medina, A., & Calvo, A.
On-design pre-optimization and off-design analysis of hybrid Brayton thermosolar tower power plants for different fluids and plant configurations *Renewable and Sustainable Energy Reviews*, 2020, vol. 119, p. 109590 ISSN: 1364-1321 (12.110 Q1)
12. Queiruga-Dios, A., Santos Sánchez, M. J., Queiruga Dios, M., Gayoso Martínez, V., & Hernández, A.
A Virus Infected Your Laptop. Let's Play an Escape Game *Mathematics*, 8(2), 166, 2020 ISSN: 2227-7390 (1.747 Q1)
13. Gonzalez-Ayala, J., Santillán, M., Santos, M., Calvo, A., and Mateos-Roco, J.
Optimization and Stability of Heat Engines: The Role of Entropy Evolution *Entropy*, 20(11), 865, 2018 ISSN: 1099-4300 (2.419 Q2)
14. M.J. Santos, C. Miguel-Barbero, R.P. Merchán, A. Medina, and A. Calvo
Roads to improve the performance of hybrid thermosolar gas turbine power plants: Working fluids and multi-stage configurations *Ener. Conv. Manage.* 165, 578-592 (2018) ISSN: 0196-8904 Oxford, England (7.181 Q1) Cited by 14 (record WoS Dic. 2021)
15. R.P. Merchán, M.J. Santos, A. Medina, and A. Calvo
Thermodynamic model of a hybrid Brayton thermosolar plant *Renew. Ener.*, 128, 473-484 (2018) ISSN: 0960-1481 Oxford, England (5.439 Q1) Cited by 11 (record WoS Dic. 2021)
16. R.P. Merchán, M.J. Santos, I. Reyes-Ramirez, A: Medina, and A. Calvo
Modeling hybrid solar gas-turbine power plants: Thermodynamic projection of annual performance and emissions *Ener. Conv. Manage.* 134, 314-326 (2017) ISSN: 0196-8904 Oxford, England (6.377 Q1) Cited by 15 (record WoS Dic. 2021)

C.2. Research projects (last 5 years)

1. Title: *Low-scale hybrid thermosolar plants for distributed energy generation*
Regional level
Main researchers: Calvo, A.
Number of researchers: 7
Financing entity: JCyL (Spain), SA017-P17
Dates: 01/01/2017 - 31/12/2019, 3 years
Budget: 108.380 €
2. Title: *Efficient energy converters and sustainable working fluids*
National level
Main researchers: J.A. White Sánchez; Calvo, A.
Number of researchers: 13
Financing entity: MINECO (Spain), ENE2013-40644-R
Dates: 01/01/2014 - 31/12/2016, 3 years
Budget: 56.870 €
3. RULES_MATH: New Rules for assessing Mathematical Competencies.
Erasmus+ Programme of the European Union
Main researcher: A. Queiruga-Dios
Financing entity: EU (2017-1-ES01-KA203-038491)
Dates: 01/09/2017 - 31/08/2020
Budget: 388.670,00 €
4. European Project: LOG-IN-GREEN: Training Green Logistics Managers to Avoid the Environmental Effects of Logistics
Erasmus+ Programme of the European Union
Main researcher: Y. Muratoglu (Hitit üniversitesi), A. Queiruga-Dios (USAL)
Financing entity: EU (2018-1-TR01-KA205-057424)
Dates: desde 30/09/2018 a 29/09/2020



Budget: 25.333 €

5. European Project: EUCYS-USAL European Union Contest for Young Scientists' 2020 - EUCYS_USAL Ref: 953360 Programme of the European Union – European Commission

Main researcher: J.M.M. Roco & S. Pérez (USAL)

Financing entity: EU (18.U112/465AC05)

Dates: 01/01/2020 - 31/10/2021

Budget: 960.000 €

6.- European Project: GIRLS: Generation for Innovation, Resilience, Leadership and Sustainability. The Game is on! Erasmus+ Programme of the European Union

Main researcher: A. Queiruga-Dios (USAL)

Financing entity: EU (2022-1-ES01-KA220-HED-000089166)

Dates: desde 1/09/2022 a 31/08/2025

Budget: 400.000 €

7. - European Project: EARN-PORTAL: Empowering Youth Workers Against Radicalization. Erasmus+ Programme of the European Union

Main researcher: A. Queiruga-Dios

Financing entity: EU (2022/00465/001)

Dates: desde 31/12/2022 a 30/12/2024

Budget: 250.000 €

C.3. Contracts, technological or transfer merits (last 5 years)

1. Ref.: IQPC-TERMOSOLARES

Title: *Thermo-economic optimization of recuperative multi-stage hybrid thermosolar plants in Castilla y León*

Main researcher: A. Medina

Financing Entity: Junta de Castilla y León, Fundación General USAL

Period: 01/04/2016 – 31/03/2017

Budget: 6.000 €

2. Ref.: PC-TCUE-18-20_002

Title: *Clean and efficient generation of electricity and heat on a small scale: hybrid thermosolar dish.*

Financing entity: JCYL, Fundación General USAL

Main researcher: M. J. Santos

Period: 19/12/2018 – 19/12/2019

Budget: 10.000 €

3. Ref.: BraySolDish

Title: *Parabolic dish thermosolar concentration plant with hybrid Brayton cycle for distributed power generation*

Financing entity: Fundación General USAL

Main researcher: M.J. Santos & I. Heras

Period: 01/07/2019 – 30/09/2020

Budget: 8.000 €

4. Ref.: PC_TCUE18-20P_010

Title: *Estudio de viabilidad de una planta termosolar de torre central operando con CO2 supercrítico y almacenamiento térmico*

Financing entity: Fundación General USAL

Main researcher: R.P. Merchán

Period: 21/04/2021 – 30/09/2021

Budget: 4.500 €